

### AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the application.

1. (Original) A biointerface membrane, the membrane comprising:  
a first domain, wherein the first domain comprises a solid portion having a plurality of interconnected cavities formed therein, wherein the solid portion comprises silicone; and  
a second domain, wherein the second domain is permeable to the passage of an analyte and is impermeable to cells or cell processes.
2. (Original) The biointerface membrane according to claim 1, wherein the first domain comprises an architecture that supports tissue ingrowth or interferes with barrier cell layer formation.
3. (Original) The biointerface membrane according to claim 1, wherein the cavities form a cavernous configuration with a depth of greater than one cavity in three dimensions substantially throughout the entirety of the first domain.
4. (Currently amended) The biointerface membrane according to claim 1, wherein a substantial number of the cavities are from about 20 microns to about 2000 microns in at least one dimension.
5. (Original) The biointerface membrane according to claim 1, wherein a substantial number of the cavities are from about 25 microns to about 1000 microns in at least one dimension.
6. (Original) The biointerface membrane according to claim 3, wherein the cavities are formed in a plurality of layers, each layer having different cavity dimensions.
7. (Original) The biointerface membrane according to claim 1, wherein the second domain comprises a biostable material.
8. (Original) The biointerface membrane according to claim 7, wherein the biostable material comprises a hydrophobic portion and a hydrophilic portion.
9. (Original) The biointerface membrane according to claim 7, wherein the biostable material comprises polyurethane.

10. (Original) The biointerface membrane according to claim 7, wherein the biostable material comprises polyurethane and a hydrophilic polymer.

11. (Original) The biointerface membrane according to claim 7, wherein the biostable material comprises polyurethane and polyvinylpyrrolidone.

12. (Original) The biointerface membrane according to claim 7, wherein the biostable material comprises silicone and a hydrophilic component.

13. (Original) The biointerface membrane according to claim 7, wherein the biostable material comprises silicone and polyethylene glycol.

14. (Original) An implantable device, the device comprising a biointerface membrane, the membrane comprising a first domain and a second domain, wherein the first domain is distal to the implantable device, wherein the first domain comprises a solid portion comprising silicone and having a plurality of interconnected cavities formed therein, wherein the second domain is proximal to the implantable device, and wherein the second domain is permeable to the passage of a chemical and is impermeable to cells or cell processes.

15. (Original) The implantable device of Claim 14, comprising an analyte sensor.

16. (Original) The implantable device of Claim 14, comprising a glucose sensor.

17. (Withdrawn) The implantable device of Claim 14, comprising a cell transplantation device.

18. (Withdrawn) The implantable device of Claim 14, comprising a drug delivery device.

19. (Withdrawn) The implantable device of Claim 18, wherein the drug delivery device is selected from the group consisting of a pump, a microcapsule, and a macrocapsule.

20. (Withdrawn) The implantable device of Claim 14, comprising an electrical signal measuring device.

21. (Withdrawn) The implantable device of Claim 14, comprising an electrical pulse delivering device.

22. (Currently Amended) A method of monitoring an analyte level, the method comprising:

providing a host;

providing implanting an implantable analyte sensor in a host, the sensor comprising a biointerface membrane, the membrane comprising a first domain and a second domain, wherein the first domain is distal to the implantable device, wherein the first domain comprises a solid portion comprising silicone and having a plurality of interconnected cavities formed therein, wherein the second domain is proximal to the implantable device, and wherein the second domain is permeable to the passage of an analyte and is impermeable to cells or cell processes;

~~implanting the sensor in the host;~~ and

monitoring an analyte level.

23. (Original) The method according to claim 22, wherein implanting the sensor in the host comprises implanting the sensor in a subcutaneous tissue of a host.

24. (Original) The method according to claim 22, wherein the analyte sensor is configured to permit accurate continuous analyte sensing.

25. (Original) The method according to claim 22, wherein implanting the sensor in the host comprises implanting the sensor in a subcutaneous tissue of a host.

26. (Previously presented) An implantable device, the device comprising:

a membrane, the membrane comprising a biointerface region comprising a cavernous first portion and a non-cavernous second portion, wherein the non-cavernous second portion is resistant to cellular attachment, cells, or cell processes, and wherein the non-cavernous second portion is permeable to the passage of at least one chemical.

27. (Original) The implantable device according to claim 26, wherein the cavernous first portion comprises a solid portion and a plurality of interconnected cavities that support tissue ingrowth and interfere with barrier cell layer formation.

28. (Original) The implantable device according to claim 27, wherein the cavernous first portion comprises a depth of greater than one cavity in three dimensions substantially throughout the entirety of the cavernous first portion.

29. (Original) The implantable device according to claim 27, wherein a substantial number of the cavities are from about 20 microns to about 2000 microns in at least one dimension.

30. (Original) The implantable device according to claim 27, wherein a substantial number of the cavities are from about 25 microns to about 1000 microns in at least one dimension.

31. (Original) The implantable device according to claim 27, wherein the cavities are formed in a plurality of layers, each layer having different cavity dimensions.

32. (Original) The implantable device according to claim 26, wherein the second portion comprises a biostable material.

33. (Original) The implantable device according to claim 32, wherein the biostable material comprises a hydrophobic portion and a hydrophilic portion.

34. (Original) The implantable device according to claim 32, wherein the biostable material comprises polyurethane.

35. (Original) The implantable device according to claim 32, wherein the biostable material comprises polyurethane and a hydrophilic polymer.

36. (Original) The implantable device according to claim 32, wherein the biostable material comprises polyurethane and polyvinylpyrrolidone.

37. (Original) The implantable device according to claim 32, wherein the biostable material comprises silicone and a hydrophilic component.

38. (Previously presented) The implantable device according to claim 32, wherein the first portion comprises silicone.

39. (Original) The implantable device according to claim 26, wherein the device comprises an implantable glucose sensor.

40. (Withdrawn) The implantable device according to claim 26, wherein the device comprises a cell transplantation device.

41. (Withdrawn) The implantable device according to claim 26, wherein the device comprises a drug delivery device.

42. (Withdrawn) The implantable device according to claim 41, wherein the drug delivery device is selected from the group consisting of a pump, a microcapsule, and a macrocapsule.

43. (Withdrawn) The implantable device according to claim 26, wherein the device comprises an electrical signal measuring device.

44. (Withdrawn) The implantable device according to claim 26, wherein the device comprises an electrical pulse delivering device.

45. (Currently amended) An implantable glucose sensor, the sensor comprising:  
a porous silicone portion configured to allow cells and cell processes to pass through; and

a non-porous skin, wherein the non-porous skin is adjacent to the porous silicone portion, and wherein the non-porous skin is permeable to glucose and is impermeable to cells or cell processes.

46. (Currently amended) An implantable sensor, the sensor comprising:  
a porous membrane comprising silicone configured to allow cells and cell processes to pass through; and

a non-porous membrane that is permeable to analytes and impermeable to cells and cell processes.

47. (Currently amended) An implantable glucose sensor, the sensor comprising:  
a fibrous domain that supports tissue ingrowth and that is configured to allow cells and cell processes to pass through; and

a non-fibrous domain, wherein the non-fibrous domain is adjacent to the fibrous domain, and wherein the non-fibrous domain is permeable to analytes is impermeable to cells or cell processes.

48-51. (Canceled)